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# Clackamas County: Tobacco License Impact Analysis

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The Clackamas County Public Health Division serves the County by overseeing local health programs and intiatives, collecting and analyzing health data, and performing vital administrative and regulatory services.

NERC is based at Portland State University in the College of Urban and Public Affairs. The Center focuses on economic research that supports public-policy decision-making, and relates to issues important to the Pacific Northwest and the Portland Metropolitan Area. NERC serves the public, nonprofit, and private sector with economic analysis. Dr. Tom Potiowsky is the Director of NERC, and is the former Chair of the Department of Economics at Portland State University. Dr. Jenny H. Liu is NERC's Assistant Director and Assistant Professor in the Toulan School of Urban Studies and Planning. This report was researched and written by Peter Hulseman, with research support from Emma Willingham.

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# Executive Summary

Passage of Senate Bill 754 (Tobacco 21) in August of 2017 raised the tobacco sales age from 18 to 21 in Oregon. However, there is currently no state law requiring retailers to have a license to sell tobacco products within the state. Without a full registry of tobacco vendors, it is difficult to determine whether or not said vendors are complying with the new law. Other counties within Oregon have adopted regional tobacco retail license programs, which help to ensure compliance with Tobacco 21. With this in mind, the Clackamas County Public Health Division requested that the Northwest Economic Research Center (NERC) investigate the potential economic impacts of adopting a county-wide Tobacco Retail License for the Public Health Division to inform decision makers.

To accomplish this, NERC used the modelling software IMPLAN. NERC relied on existing literature for potential effects that cannot be modeled by IMPLAN. It should be noted that, while some implications of Tobacco 21 are discussed, this report is primarily an analysis of the economic impact of tobacco retail licensing (TRL) for Clackamas County.

If TRL goes into effect, Clackamas County would see a reduction in employment of 4.12 Full Time Equivalent (FTE) positions, and a corresponding decreased in gross wages of $129,185 (see Table 1). To put these numbers in perspective, in 2016 – the most recent year of IMPLAN data – there were 220,375 FTE employees in Clackamas County and 7,127 FTE employees in the industries included in the analysis. Labor Income was $10,191,352,866 and $204,899,969 respectively.

This only includes the loss of employment to the private sector and does not include the public employees who would be hired to regulate this industry – which would mitigate these effects. Estimates by Health Equity Zone (HEZ) are shown in Appendix A.

**Table 1**: **Clackamas County Economic Impacts**[1]

| Impact Type | Employment | Labor Income |
|---|---|---|
| Direct Effect | -3.20 | -$89,474 |
| Indirect Effect | -0.41 | -$18,106 |
| Induced Effect | -0.52 | -$21,605 |
| **Total Effect** | **-4.12** | **-$129,185** |

The IMPLAN model is static, meaning that the above estimates do not account for dynamic price adjustments of tobacco and nicotine products, long-term health effects of tobacco, or decreases in tobacco revenue due to increased compliance with the minimum legal sales age.

[1] Indirect effects represent the effects on other firms in the supply chain. Induced effects indicate economic activity supported by wages.

Tobacco, like many addictive products, is a notoriously inelastic good—meaning that there is a disproportionately small decrease in demand to any increase in price. One current estimate for the price elasticity of tobacco in the United States is –0.4.[2] This means that for a 1% increase in price, demand only decreases by 0.4%: retailers make more money by increasing the price of a good than they lose from the subsequent decrease in demand. Therefore, increasing the price is a viable method to pass on increased operational costs to consumers. This potential response is not included in the analysis.

Another limitation of the analysis is that of increased compliance with the new, higher legal sales age of tobacco and nicotine products. Without tobacco retail licensing it is difficult to enforce laws such as Tobacco 21. Hence, by passing tobacco retail licensing, retailers that previously skirted Tobacco 21 now are bearing the full cost of the regulation.

By increasing compliance, tobacco retail licensing indirectly brings about the health effects associated with Tobacco 21. Although this is not an analysis of Tobacco 21, these effects should be mentioned as there is potential for significant, positive, long-run economic impacts. The potential directions of these effects, which do not appear in the model, are shown in Table 2 below.

**Table 2**: **Direction of other Potential Effects**

| Type of Effect | Direction of Effect |
|---|---|
| **Dynamic Price Adjustment (Elasticity)** | Mitigates Negative Impact |
| **Increased Compliance** | Exacerbates Negative Impact |
| **Long-term Health Effects** | Mitigates Negative Impact |

In summary, IMPLAN estimates a total impact of 4.12 less FTE employees for Clackamas County out of the 7,127 FTE employees estimated in the pertinent industries in 2016. There are factors that could mitigate and exacerbate the negative impact including the dynamic price adjustments of tobacco and nicotine products, long-term health effects of tobacco use, or decreases in tobacco revenue due to increased compliance with the legal sales age. Overall, tobacco retail licensing is unlikely to have a significant adverse effect on the Clackamas County economy.

[2] World Health Organization (2012). *The demand for cigarettes and other tobacco products* [PowerPoint Slides]. Retrieved from: http://www.who.int/tobacco/economics/2_1ffactorsaffectingconsumerbehavior.pdf

# Introduction

Preventing smoking initiation for teenagers is a major goal of public health officials everywhere. This is in part due to the well-known health risks of smoking, but also because initiation in a person's youth leads to significantly higher chances of a long-term addiction.[3] According to the 2014 *National Survey on Drug Use and Health,* 90 percent of adult smokers began smoking during their teenage years.[4] Increasing the tobacco purchase age to 21 prevents early use of tobacco and nicotine products.

Passage of Senate Bill 754 (Tobacco 21) in August of 2017 raised the tobacco sales age from 18 to 21 in Oregon. However, there is currently no state law requiring retailers to have a license to sell tobacco products. Therefore, there are no guarantees that vendors will comply with the new law. Four counties and several cities within Oregon have adopted regional tobacco retail license requirements which helps ensure compliance with Tobacco 21. With this in mind, the Clackamas County Public Health Division requested that the Northwest Economic Research Center (NERC) investigate the potential economic impacts of adopting a county-wide Tobacco Retail License for the Public Health Division to inform decision makers.

To accomplish this, NERC used the modelling software IMPLAN. NERC relied on existing literature for potential effects that cannot be modeled by IMPLAN. It should be noted that, while some implications of Tobacco 21 are discussed, this report is primarily an analysis of the economic impact of tobacco retail licensing for Clackamas County.

[3] Bonnie, Richard J.; Stratton, Kathleen; and Kwan, Leslie Y. *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*. Retrieved from: https://www.nap.edu/read/18997/chapter/9#202

[4] United States Department of Health and Human Services. Substance Abuse and Mental Health Services Administration. Center for Behavioral Health Statistics and Quality. National Survey on Drug Use and Health, 2014. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2016-03-22. Retrieved from: https://doi.org/10.3886/ICPSR36361.v1

## Data Description

Clackamas County Public Health provided NERC with a list of known tobacco retailers by Health Equity Zone (HEZ), zip code, and industry. Clackamas County Public Health divided the county into 10 Health Equity Zones to analyze data broken down by geographic areas. The HEZs serve as a tool for residents, policy makers, community-based organizations and businesses to address the unique needs of the communities located in each of the zones. Since the geographic area in the IMPLAN model is organized by zip code, NERC sorted zip codes into HEZs. In a few instances, zip codes were encompassed by multiple HEZs so NERC placed the zip code into the HEZ in which most of its retailers were located. This resulted in a negligible effect on HEZ estimates, and no effect on the county wide estimate.

The retailer's industry type was translated and sorted into one of three IMPLAN retail industries: food and beverage (IMPLAN code 400), gas station (402), or miscellaneous (406).[5] One limitation of this analysis is that IMPLAN does not separate out industries into distinct retailers. As a result, it is impossible to isolate the impacts on small retailers or large retailers.

NERC assumed the cost for a tobacco retail license would be $600 - which Clackamas County Public Health believes to be a conservative, high estimate. Therefore, the anticipated increase to operating costs for a given HEZ is $600 multiplied by the number of retailers. For example, if there are three gas stations in the Molalla HEZ selling tobacco and nicotine products, then NERC would input an increased operating cost of $1,800 for the gas station retailer industry into IMPLAN Molalla model (zip codes: 97038 and 97042).

[5] Defined, in detail, in Appendix C.

## Description of IMPLAN

IMPLAN is one the industry standard models for doing economic impact analysis. IMPLAN models are constructed using Social Accounting Matrices (SAM) based on spending and purchasing data from the Bureau of Economic Analysis (BEA) supplemented by data from other publicly available sources. SAMs are constructed to reflect the actual industry interactions in a region, and include government activities that are not traditionally reflected in this type of economic analysis.

SAMs create a map showing how money and resources flow through the economy. In a simulation, new economic activity is assumed to occur in an industry or group of industries. Based on past spending and purchasing activity, IMPLAN simulates the purchasing and spending necessary for this new economic activity to occur. IMPLAN tracks this new economic activity as it works its way through the economy. Also included in SAMs are household and government behavior.[6] In addition to following purchasing and spending through the private sector, IMPLAN also estimates the impact of changes in disposable income and tax revenue.

A production function is constructed for each industry, reflecting its connections to other industries. Economic changes or events are propagated through this process as new economic activity motivates additional economic activity in other parts of the supply chain, and through changes in spending habits.

IMPLAN breaks out analysis results into three types of impact: direct, indirect, and induced.

- **Direct Impacts**: These are defined by the modeler, and placed in the appropriate industry. In this case, the direct impact is the increased operating cost for

[6] Defined in Appendix C.

**IMPLAN Impacts**

The impact summary results are given in terms of employment, labor income, total value added, and output:

**Employment** represents the number of annual, 1.0 FTE jobs. These job estimates are derived from industry wage averages.

**Labor Income** is made up of total employee compensation (wages and benefits) as well as proprietor income. Proprietor income is profits earned by self-employed individuals.

**Total Value Added** is made up of labor income, property type income, and indirect business taxes collected on behalf of local government. This measure is comparable to familiar net measurements of output like gross domestic product.

**Output** is a gross measure of production. It includes the value of both intermediate and final goods. Because of this, some double counting will occur. Output is presented as a gross measure because IMPLAN is capable of analyzing custom economic zones. Producers may be creating goods that would be considered intermediate from the perspective of the greater national economy, but may leave the custom economic zone, making them a local final good.

tobacco retailers. The IMPLAN model uses built in estimates to translate this into direct employment, labor income, and value-added lost.

- **Indirect Impacts**: These impacts are estimated based on national purchasing and sales data that model the interactions between industries. This category reflects the economic activity necessary to support the new economic activity in the direct impacts by other firms in the supply chain.

- **Induced Impacts**: These impacts are created by the change in wages and employee compensation. Employees change purchasing decisions based on changes in income and wealth.

# IMPLAN Analysis

To conduct the analysis, NERC assumed that the retailer bears the full cost of the tobacco retail license as an increase to their operating costs. The economic impacts for Clackamas County are shown below in Table 3. All values are in 2018 dollars. Impacts by HEZ are shown in Appendix A at the end of this report.

**Table 3**: **Clackamas County Economic Impacts**[7]

| Impact Type | Employment | Labor Income |
|---|---|---|
| Direct Effect | -3.20 | -$89,474 |
| Indirect Effect | -0.41 | -$18,106 |
| Induced Effect | -0.52 | -$21,605 |
| **Total Effect** | **-4.12** | **-$129,185** |

The year tobacco retail licensing goes into effect, Clackamas County will see a reduction in employment of 4.12 Full Time Equivalent (FTE) employees and gross wages of $129,185. This only includes the loss of employment to the private sector and does not include the additional employees to regulate this industry – which would mitigate these effects. To put these numbers in perspective, in 2016 – the most recent year of IMPLAN data – there were 220,375 FTE employees in Clackamas County and 7,127 FTE employees in the industries included in the analysis. Labor Income was $10,191,352,866 and $204,899,969 respectively.

# Other Potential Factors

The IMPLAN model is static, meaning that the above estimates do not account for dynamic price adjustments of tobacco and nicotine products, long-term health effects of tobacco use, or decreases in tobacco revenue due to increased compliance with the legal sales age. Some potential effects are discussed below.

## Dynamic Price Adjustment (Elasticity)

Tobacco, like many addictive products, is a notoriously inelastic good—meaning that there is a disproportionately small decrease in demand to any increase in price. One current estimate for the price elasticity of tobacco in the United States is –0.4.[8] This means that for a 1% increase in price, demand only decreases by 0.4%: retailers make more money by increasing the price of a good than they lose from the subsequent decrease in demand. Therefore, increasing the price is a viable method to pass on increased operational costs to consumers.

[7] Total Value Added and Output are included in a table in Appendix A.
[8] World Health Organization (2012). *The demand for cigarettes and other tobacco products* [PowerPoint Slides]. Retrieved from: http://www.who.int/tobacco/economics/2_1ffactorsaffectingconsumerbehavior.pdf

Typically, market competition prevents such price increases. However, for a market-wide[9] disturbance—such as tobacco retail licensing—every retailer faces the same increase in operating costs and is therefore better able to pass it on to consumers. The inelastic nature of tobacco products likely means that the employment and wage effects of the license fee would be less than indicated in Table 3, as consumers would share some of the increased cost.

## Compliance

Another limitation of the analysis is that of increased compliance with the legal sales age of tobacco and nicotine products. Without tobacco retail licensing it is difficult to enforce laws such as Tobacco 21. By passing tobacco retail licensing, retailers that previously skirted Tobacco 21 now are bearing the full cost of the regulation. This means that Table 3 underestimates the negative employment and wage effects, as tobacco retail licensing would increase compliance for other regulations (specifically, Tobacco 21).

Oregon conducts two types of compliance checks for tobacco retailers: Synar Inspections, required as part of the federal Synar Amendment prohibiting the sale of tobacco to minors, and Enforcement Inspections. Results for these state enforcement inspections vary considerably from year to year: over the 2013-2018 period, Clackamas County's overall failure rate ranged from 14-25%.

## Long-term Health Effects

By increasing compliance, tobacco retail licensing indirectly brings about the health effects associated with Tobacco 21. Although this is not an analysis of Tobacco 21, these effects should be mentioned as there is potential for significant long-run economic impacts.

The health affected associated with tobacco use are known to increase medical costs and decrease quality of life. Additionally, the loss of life associated with tobacco usage decreases employment and other economic activity. The Oregon Health Authority, using a Center for Disease Control methodology, estimates the total effect of tobacco use in Oregon to be $2.5 billion a year.[10] The magnitude of dynamic, long-run estimates such as these are difficult to verify – but tobacco usage does inflict large costs on society over the span of decades. By encouraging Tobacco 21 compliance among retailers, youth initiation rates (and thus long-term medical costs) will decrease, indicating that the estimates in Table 3 overestimate the negative effects of tobacco retail licensing.

[9] Retailers bordering counties without tobacco retail licensing would not be experiencing a "market-wide" disturbance as other competitors in their market don't have the same increase in operating cost.
[10] Oregon Health Authority Public Health Division, Health Promotion and Chronic Disease Prevention Section. 2017. Oregon tobacco facts. Available, along with other years, at https://public.health.oregon.gov/PreventionWellness/TobaccoPrevention/Pages/pubs.aspx.

The direction of the above potential effects are shown in the table below.

**Table 4: Direction of Other Potential Effects**

| Type of Effect | Direction of Effect |
|---|---|
| **Dynamic Price Adjustment (Elasticity)** | Mitigates Negative Impact |
| **Increased Compliance** | Exacerbates Negative Impact |
| **Long-term Health Effects** | Mitigates Negative Impact |

## Conclusion

In summary, IMPLAN estimates a total impact of 4.12 less FTE employees for Clackamas County out of the 7,127 FTE employees estimated in the pertinent industries in 2016. There are factors that could mitigate and exacerbate the negative impact including the dynamic price adjustments of tobacco and nicotine products, long-term health effects of tobacco use, or decreases in tobacco revenue due to increased compliance with the legal sales age. Overall, tobacco retail licensing is unlikely to have a significant adverse effect on the Clackamas County economy.

# Appendix A: Economic Impact by Health Equity Zone

Below are the 2016 estimates IMPLAN reports for population, total employment, and total personal income, along with the complete economic impact tables for Clackamas County and each Health Equity Zone. All values are in 2018 dollars.

**Tables A1**: **Clackamas County Economic Impacts**

| Clackamas County | |
|---|---|
| Population | 408,062 |
| Total Employment | 220,375 |
| Total Personal Income | $20,476,346,368 |

| Impact Type | Employment[11] | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -3.20 | -$89,474 | -$101,981 | -$166,800 |
| Indirect Effect | -0.41 | -$18,106 | -$37,078 | -$61,464 |
| Induced Effect | -0.52 | -$21,605 | -$39,052 | -$65,830 |
| **Total Effect** | **-4.12** | **-$129,185** | **-$178,111** | **-$294,094** |

**Tables A2: 2018 Impacts, Canby**

| Canby | |
|---|---|
| Population | 24,929 |
| Total Employment | 11,636 |
| Total Personal Income | $1,250,938,112 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.20 | -$5,771 | -$6,664 | -$10,800 |
| Indirect Effect | -0.01 | -$452 | -$927 | -$1,542 |
| Induced Effect | -0.02 | -$706 | -$1,403 | -$2,354 |
| **Total Effect** | **-0.23** | **-$6,930** | **-$8,995** | **-$14,696** |

[11] The total impact does not always exactly equal the sum of the direct, indirect, and induced impacts due to rounding.

**Tables A3: 2018 Impacts, Colton**

| Colton | |
|---|---|
| Population | 3,204 |
| Total Employment | 569 |
| Total Personal Income | $160,794,464 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.02 | -$664 | -$694 | -$1,200 |
| Indirect Effect | -0.00 | -$27 | -$69 | -$126 |
| Induced Effect | -0.00 | -$13 | -$56 | -$91 |
| **Total Effect** | **-0.02** | **-$704** | **-$819** | **-$1,417** |

**Tables A4: 2018 Impacts, Estacada**

| Estacada | |
|---|---|
| Population | 14,439 |
| Total Employment | 3,877 |
| Total Personal Income | $724,536,608 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.12 | -$3,219 | -$3,660 | -$6,000 |
| Indirect Effect | -0.00 | -$207 | -$518 | -$866 |
| Induced Effect | -0.01 | -$175 | -$486 | -$804 |
| **Total Effect** | **-0.13** | **-$3,601** | **-$4,664** | **-$7,669** |

**Tables A5: 2018 Impacts, Gladstone**

| Gladstone | |
|---|---|
| Population | 13,164 |
| Total Employment | 4,304 |
| Total Personal Income | $660,539,392 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.09 | -$2,863 | -$3,401 | -$5400 |
| Indirect Effect | -0.01 | -$198 | -$502 | -$800 |
| Induced Effect | -0.01 | -$245 | -$543 | -$867 |
| **Total Effect** | **-0.10** | **-$3,306** | **-$4,447** | **-$7,067** |

**Tables A6: 2018 Impacts, Lake Oswego**

| Lake Oswego | |
|---|---|
| Population | 46,176 |
| Total Employment | 38,730 |
| Total Personal Income | $2,317,096,320 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.25 | -$7,719 | -$8,865 | -$14,400 |
| Indirect Effect | -0.02 | -$,1039 | -$2,187 | -$3,649 |
| Induced Effect | -0.03 | -$1,111 | -$1,976 | -$3,395 |
| **Total Effect** | **-0.30** | **-$9,869** | **-$13,028** | **-$21,444** |

**Tables A7: 2018 Impacts, Molalla**

| Molalla | |
|---|---|
| Population | 20,618 |
| Total Employment | 7,292 |
| Total Personal Income | $1,034,586,832 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.12 | -$3,549 | -$4,026 | -$6,600 |
| Indirect Effect | -0.01 | -$245 | -$539 | -$919 |
| Induced Effect | -0.01 | -$314 | -$662 | -$1,090 |
| **Total Effect** | **-0.13** | **-$4,109** | **-$5,227** | **-$8,610** |

**Tables A8: 2018 Impacts, North Clackamas**

| North Clackamas | |
|---|---|
| Population | 124,419 |
| Total Employment | 80,424 |
| Total Personal Income | $6,243,259,008 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -1.06 | -$30,082 | -$34,920 | -$56,400 |
| Indirect Effect | -0.11 | -$5,343 | -$9,736 | -$16,149 |
| Induced Effect | -0.18 | -$7,864 | -$13,630 | -$23,258 |
| **Total Effect** | **-1.35** | **-$43,290** | **-$58,285** | **-$95,808** |

**Tables A9: 2018 Impacts, Oregon City**

| Oregon City | |
|---|---|
| Population | 60,770 |
| Total Employment | 22,203 |
| Total Personal Income | $3,049,432,336 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.52 | -$13,876 | -$15,641 | -$25,800 |
| Indirect Effect | -0.03 | -$1,306 | -$3,070 | -$5,103 |
| Induced Effect | -0.06 | -$2,373 | -$4,326 | -$7,194 |
| **Total Effect** | **-0.61** | **-$17,556** | **-$23,036** | **-$38,097** |

**Tables A10: 2018 Impacts, Oregon Trail**

| Oregon Trail | |
|---|---|
| Population | 32,378 |
| Total Employment | 12,126 |
| Total Personal Income | $1,624,718,483 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.41 | -$11,340 | -$12,645 | -$21,000 |
| Indirect Effect | -0.03 | -$938 | -$2,253 | -$3,634 |
| Induced Effect | -0.03 | -$1,167 | -$2,436 | -$4,006 |
| **Total Effect** | **-0.47** | **-$13,445** | **-$17,334** | **-$28,640** |

**Tables A11: 2018 Impacts, West Linn - Wilsonville**

| West Linn - Wilsonville | |
|---|---|
| Population | 54,961 |
| Total Employment | 36,211 |
| Total Personal Income | $2,757,918,720 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.40 | -$10,390 | -$11,465 | -$19,200 |
| Indirect Effect | -0.04 | -$1,666 | -$3,468 | -$5,829 |
| Induced Effect | -0.04 | -$1,485 | -$2,881 | -$4,827 |
| **Total Effect** | **-0.48** | **-$13,540** | **-$17,815** | **-$29,855** |

# Appendix B: Economic Impact by City Zip Codes

Clackamas County requested that NERC provide the above tables for select cities. IMPLAN does not have city level models; however, NERC used zip codes contained within each of the cities for a reasonable approximation. Below are the 2016 estimates IMPLAN reports for population, total employment, and total personal income, along with the complete economic impact tables for the cities of Happy Valley, Milwaukie, West Linn, and Wilsonville. All values are in 2018 dollars.

**Tables B1: 2018 Impacts, Happy Valley (Zip Code: 97086)**

| Happy Valley | |
|---|---|
| Population | 29,809 |
| Total Employment | 10,793 |
| Total Personal Income | $1,495,815,808 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.11 | -$3,154 | -$3,828 | -$6,000 |
| Indirect Effect | -0.01 | -$238 | -$553 | -$907 |
| Induced Effect | -0.01 | -$283 | -$599 | -$1,005 |
| **Total Effect** | **-0.12** | **-$3,677** | **-$4,981** | **-$7,913** |

**Tables B2: 2018 Impacts, Milwaukie (Zip Codes: 97222, 97267, and 97269)**

| Milwaukie | |
|---|---|
| Population | 72,459 |
| Total Employment | 35,684 |
| Total Personal Income | $3,635,931,392 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| **Direct Effect** | -0.65 | -$18,271 | -$21,094 | -$34,200 |
| **Indirect Effect** | -0.06 | -$2,846 | -$5,304 | -$8,730 |
| **Induced Effect** | -0.08 | -$3,619 | -$6,667 | -$10,913 |
| **Total Effect** | **-0.79** | **-$24,737** | **-$33,067** | **-$53,844** |

**Tables B3: 2018 Impacts, West Linn (Zip Code: 97068)**

| West Linn | |
|---|---|
| Population | 30,607 |
| Total Employment | 10,193 |
| Total Personal Income | $1,535,827,456 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| **Direct Effect** | -0.21 | -$5,568 | -$5,980 | -$10,200 |
| **Indirect Effect** | -0.02 | -$563 | -$1,314 | -$2,166 |
| **Induced Effect** | -0.01 | -$438 | -$930 | -$1,543 |
| **Total Effect** | **-0.24** | **-$6,571** | **-$8,225** | **-$13,910** |

**Tables B4: 2018 Impacts, Wilsonville (Zip Code: 97070)**

| Wilsonville | |
|---|---|
| Population | 24,354 |
| Total Employment | 26,018 |
| Total Personal Income | $1,222,091,264 |

| Impact Type | Employment | Labor Income | Total Value Added | Output |
|---|---|---|---|---|
| Direct Effect | -0.19 | -$4,821 | -$5,485 | -$9,000 |
| Indirect Effect | -0.02 | -$792 | -$1,631 | -$2,766 |
| Induced Effect | -0.01 | -$515 | -$1,002 | -$1,690 |
| **Total Effect** | **-0.22** | **-$6,129** | **-$8,119** | **-$13,457** |

# Appendix C: Definitions

**Price Elasticity of Demand**: The degree to which demand is sensitive to a change in price.

**Government Behavior**: Taxation and spending patterns of the government.

**Household Behavior:** Employment and spending patterns of households.

**Industry**: A particular form or branch of economic or commercial activity, typically named after the principal product or service. Pertinent industries are described below.

**Retail – Food and Beverage**: Industries in the Food and Beverage Stores subsector usually retail food and beverages merchandise from fixed point-of-sale locations. Establishments in this subsector have special equipment (e.g., freezers, refrigerated display cases, refrigerators) for displaying food and beverage goods. They have staff trained in the processing of food products to guarantee the proper storage and sanitary conditions required by regulatory authority. Examples: Grocery Stores, Specialty Food Stores, and Beer, Wine, and Liquor Stores. Retrieved from BLS.gov.

**Retail – Gasoline Stores**: Industries in the Gasoline Stations subsector retail automotive fuels (e.g., gasoline, diesel fuel, gasohol, alternative fuels) and automotive oils or retail these products in combination with convenience store items. These establishments have specialized equipment for the storage and dispensing of automotive fuels. Retrieved from BLS.gov.

**Retail - Miscellaneous**: Industries in the Miscellaneous Store Retailers subsector retail merchandise from fixed point-of-sale locations (except new or used motor vehicles and parts; new furniture and home furnishings; new appliances and electronic products; new building materials and garden equipment and supplies; food and beverages; health and personal care goods; gasoline; new clothing and accessories; and new sporting goods, hobby goods, books, and music). Establishments in this subsector include stores with unique characteristics like florists, used merchandise stores, and pet and pet supply stores as well as other store retailers. Includes tobacco specialty stores (those engaged in retailing cigarettes, cigars, tobacco, pipes, and other smokers' supplies). Retrieved from BLS.gov.

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